

Leif first reported the comparison between MAD model and Booster dispersion measurement with bump on/off. It was done during NSRL running period. In general, it shows good agreement. Next, Leif showed the orbit response matrix (ORM) data analysis for injection horizontal kick in the G section. The difference orbit with bump on and off showed smooth oscillation, except higher amplitude near the cold snake and a cusp at the kicker location. The coupling is not much for some correction dipole kick, while strong vertical oscillation is seen for other correction dipole kicks. With vertical tune set as 8.91 at injection, it seems that the vertical betatron motion is sensitive to the horizontal motion. Thomas noticed that the difference orbit does not average as zero. To get the ORM analysis correctly, coupling has to be taken into account. Kevin commented that Todd is going to give an update on the analysis tomorrow. We are going to take ORM data with Au beam (without snake effect).

Fanglei reported the progress on spin tracking. After eliminating the lattice with vertical tune very close to 9 (due to unstable MAD calculation) and raising injection vertical tune to 8.91 (the one we actually used during the run), the emittance growth is largely gone and polarization loss seen near $G\gamma = 8$ is gone. The spin does not change much with and without the orbit renormalization, but emittance is conserved with the renormalization. There are still bad MAD lattice files which can be eliminated by a more strict condition. She compared various γ steps of 0.2 to 1.5. The tracking time for one particle from injection to extraction is about 20 minutes, and not affected by how often the lattice is updated. The tracking with γ step of 0.2 and 0.5 give similar results. Thomas pointed out that spin mismatch happened at first lattice update, $G\gamma = 4.86$. It indicates that the 0.2 step size is not enough for the early part of tracking. Fanglei will reduce the step size at early part of the ramp. After that, the single particle tracking can be used to compare with polarization profile measurement, synchrotron motion effect and early part of ramp simulation (slow ramp rate, vertical tune is not in the spin tune gap). All of these will provide sensitivity of AGS final polarization on various parameters.

There will be no spin meeting next week.

Haixin